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of inestimable value, since it enables me to add with great facility, and perform any simple mathematical operation with ease and dispatch. I have only to conceive of the numbers before me to be arranged in any required way, as in my scheme in their positions, and they are there without further ado.

As I hinted in the beginning, my mother was the only other person known to me to possess this experience. Hers was a conception of a circle of the numbers from 1 to 100, just the same as my conception of the months of the year. I have repeatedly attempted to make a chart of the scheme as it appears to my mind, but have found it impossible on account of the almost constant change of plane and direction, and the sense of gradually increasing space. I know of nothing that could have given a suggestion of the scheme. The impression came too early to have been suggested by any experience, if there had been one to suggest it.

I add this bit in the hope of further drawing out the discussion of the topic, and I shall look with great interest for further notes.

LYNDS JONES.

Oberlin College, Oberlin, Ohio.

#### ENGLISH ORTHOGRAPHY.

A new orthography by J. I. D. Hinds, in *Science* for July 21, is cleverly handled, although some slight inconsistencies have crept in, which, I think, the author has overlooked, in his ardor to reform the present method.

English orthography is far in advance of English pronunciation, and it is a fallacy to make orthography conform phonetically to erroneous pronunciation.

The syllables "tion" and "sion" are pronounced "shun" or "zhun," a mistake or rather a wilful corruption of which no other language deriving its roots from Greek and Latin, is guilty. Now if our "dictionary manufacturers" would prescribe "nati-on" and "provi-si-on" (all vowels but the first short) in their next editions, phonetic orthography would not be compelled to use the abominable "shun" of Josh Billings.

All agree that a new system of orthography (I must be consistent and spell this ortho-graphy, second *o* long) should not be an abrupt departure from the present form. But in the first place let us have *re-vocable* in *pre-ference* (first *e* long) to *rev-ocable*, *baro-meters* and *thermo-meters*, as *weather-meters*, etc., etc.

Mr. Hinds suggests the letter "a" for an intermediate sound of "a" as in last, and also "a" for the short sound of "a" as in mat. I fail to note the difference, unless he pronounces "last" (to use his system) laast.

For the present it would, in my opinion, be pre-ferable to retain the present mode of spelling "mate" and "note," and not "maet" and "noet," not because the latter spelling is less correct, but because the change is too radical. For a like reason *th*, *sh* and *s* should be retained as now in use. It is always necessary to consider the present generation to whom such changes would be burdensome, while the rising generation will naturally adopt any plan we offer them. The diphthong *ai* as in *air* is unnecessary as "a" followed by "re" will produce that sound as in "mare," "fare," etc. The letter *q* may be pronounced *kawe*, and written without the "u" making "quick" go much "quicker." *X* is used so much for Latin prefixes that it must be retained for reasons mentioned.

These few suggestions will give printed and written pages a more familiar look, than Mr. Hinds's orthography, and easily read at sight. To show the difference between the plan proposed by Mr. Hinds with the amendments I offer, it is best to use the same stanza :

SOUNDS OF IEVNING.

Swiet waas the sound, hiven oft at ievning's klose  
Up-yondur hil the villaj murmur rose,

Thare as I past with kareles steps and slo  
The mingling notes kame sofend from below  
The swane responsiv as the milk made sung,  
The sobur hurd that lode to miet thare yung  
The noisi gies that gabbeld o'r the pull  
The plaeful children just let luse from skuel,  
The wac-dog's vois that bade the hwispring weind,  
Etc., etc.

However it is idle to write and talk without taking action in this matter. Let Mr. Hinds, if he is a pedagogue, call a convention of teachers through the valuable medium of *Science*. Nothing but stubborn lethargy and indifference hinder the progress of reformation in this branch of study. European nations are continually improving their languages, but the English-speaking savant is so perfect that he alone uses a capital "I," when writing of himself. Such a character will not change his position unless he receives a violent push. FREDERICK KRAFFT.

258 Palisade Avenue, Jersey City Heights, N. J.

#### AN IMPORTANT OMISSION AT THE WORLD'S FAIR.

To any thoughtful student of affairs, with sufficient foresight to look fifty years into the future, and who realizes a few of the elementary facts regarding the appalling destruction of our forests, a visit to the beautiful Forestry Building at the World's Fair brings a sense of keen disappointment.

There is displayed, in admirable order and with scientific accuracy, nearly every fact regarding the location, size, form, color and commercial value of every kind of tree grown in the country, carefully painted or photographed specimens of leaf and blossom, and sections of trees, showing girth, bark, polished and unpolished surfaces, all carefully classified and labelled, giving evidence to the thousands of tourists who drift by with a casual glance that a great deal of painstaking work has been done, which doubtless, as a permanent museum, would be of great value to the specialist, but which, with the limited time of a tourist, can be of little value to nine hundred and ninety-nine out of every thousand who will see it. The only general impression to be gathered from all this elaborate multiplicity of detail, at the time of our visit, was that the United States produced a great variety of beautiful trees, some of them of enormous size, and that, for aught one could see, it would always continue to produce such trees in the same quantities that it had done in the past.

Nowhere was there to be found the slightest hint of the fact that we are *annually cutting off twice as much timber as we are producing*. Not a word to call the attention of the thoughtless passer-by to the importance of forests to preserve our water-courses from alternate floods and droughts, to the ruthless destruction of beautiful mountain scenery, to the urgent necessity of setting out trees on our dreary, treeless plains and barren city streets.

"There ought to be something done about it, sure enough," said a good-natured, heavy-bearded man from one of the Pacific States, with whom we earnestly discussed the matter. "I never really thought much about it, and of course it isn't in my line, for my business is destroying trees, as I'm here representing a lumber firm, like most of the others who have exhibits, but I'll take you to Mr. ———, who is in charge, and you can talk to him." Mr. ——— proved very courteous and somewhat interested in the matter, but didn't know what could be done about it, as his superior had given no directions. "But," we protested, "it could not cost more than ten or twenty dollars to put up a large placard headed: 'ATTENTION! FACTS THAT EVERY AMERICAN CITIZEN OUGHT TO KNOW,' and underneath in large, clear type, without confusing figures or statistics, give a few of the most cogent facts

in such simple form that they could be readily remembered. Not one in fifty knows these elementary facts. If this exposition is to have the educative value that it is hoped, it must be largely by providing important information in simple form, for no one can remember the endless data and statistics which are here provided, and if they could, the one most important fact of all, that we are fast approaching an utter destruction of our forests, is nowhere mentioned."

"The trouble is just here," quoth the lumberman, "everybody has got to look out for himself, and what's everybody's business is nobody's business, you know. And then some of those fellers that took up tree claims out west, well, I've known 'em many a time to plant their trees and get their land, and then let 'em all die, or sometimes even root 'em up," he added with an amused smile, as if he found the whole matter rather a good joke. "You see, most folks don't look at it as you do; twenty-five years ahead is a long time; we shan't feel the pinch much before that, and then—well"—then, we mentally continued, when, like Samson, our strength has been shorn from us, when our hills are as barren as those of Palestine, and our rivers can no longer turn the factory wheels, when our population has doubled, and the price of wood sextupled, then our children, waiting for a hundred years, and toiling with infinite cost and pains to replace what we have destroyed, may well say, "Thus are the sins of the fathers visited upon the children even unto the third and fourth generations." And Mr. ——— smiled courteously, and said he should think it would be a good plan if something could be done about it.

LUCIA TRUE AMES.

Boston, Mass

#### THE USES OF THE LITTER BY SPARROWS.

[Editor *Science*: The following incident observed by my step-son, twelve years old, may be of interest in connection with the mooted question regarding the use of tools, utensils and weapons by the lower animals.

MERWIN-MARIE SNELL.]

A few days ago, as I was walking along the street near

a little park, I saw a sparrow lying upon the ground. It fluttered its wings, but was unable to rise.

As I was looking, a pair of old birds came along carrying between them a little bare twig about three inches long. One had hold of one end of it, and its companion had hold of the other. They brought it down to the bird on the ground, and it caught hold of the stick with its beak.

Then they flew up again into a tree, carrying the third bird hanging to the stick, and by this means brought it to a place of safety.

I am not sure that the bird on the ground was a young one; it looked quite large and may have been wounded or sick. It was not able to fly, anyway, for I saw it try to do so without success. All the birds were common English sparrows.

E. STANLEY SPRAGUE.

Chicago, Ill., Aug. 7, 1893.

#### SPACE RELATION OF NUMBERS.

MR. MARTIN'S association of the natural series of numbers with a diagram in space is by no means unusual. As I have a similar association myself I have been interested in the accounts published from time to time by people, most of whom imagine their experiences to be unique. There must by this time be quite a literature of the subject, though I do not know whether any one has kept track of it. I should say, however, that most persons having a strong sense of locality would be apt to associate, not only the series of numbers but also any other series, such as the months of the year or the days of the week, with a space diagram. In my own case the natural numbers begin at my left hand quite close to me and run in a straight line diagonally in perspective into the distance towards the right. Beyond one hundred I can scarcely see them, however. The months of the year are similarly arranged save that the current month is always close to me. Most other series have some sort of space arrangement, the kings of England, for instance, beginning at a distance, and running in a very eccentric curved and zizzag line, finishing near me. I localize almost everything I memorize or think of deeply.

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